

What is claimed is:

1. A buffer formulation for calibrating pH electrodes comprising:
 - (a) a bactericide consisting essentially of benzethonium chloride; and
 - (b) a buffering agent selected from the group consisting of sodium phosphate, potassium phosphate, potassium acid phthalate, sodium carbonate, sodium bicarbonate, 2-[N-cyclohexylamino]ethanesulfonic acid, N-[2-hydroxyethyl]piperazine-N'-[2-ethanesulfonic acid], and mixtures thereof.
2. The formulation of claim 1, wherein the concentration of benzethonium chloride in the formulation is greater than 0 % but less than 0.01 % (by weight).
3. The formulation of claim 1, wherein the concentration of benzethonium chloride in the formulation is about 0.003% (by weight).
4. The formulation of claim 1, wherein the concentration of buffering agent in the formulation is at least about 50 mM.
5. The formulation of claim 1, wherein the concentration of buffering agent in the formulation is about 100 mM.
6. The formulation of claim 1, wherein the concentration of benzethonium chloride in the formulation is about 0.003% (by weight) and the concentration of the buffering agent in the formulation is about 100 mM.

7. A buffer formulation for calibrating pH electrodes comprising:
- (a) a bactericide consisting essentially of about 0.003% (by weight) benzethonium chloride;
 - (b) a buffering agent selected from the group consisting of sodium phosphate dibasic anhydrous, potassium dihydrogenphosphate, and combinations thereof;
 - (c) sodium chloride; and
 - (d) water.
8. A buffer formulation for calibrating pH electrodes comprising:
- (a) about 1 to about 15 g. potassium dihydrogen phosphate;
 - (b) about 1 to about 15 g. sodium phosphate dibasic anhydrous;
 - (c) about 2 to about 5 g. sodium chloride;
 - (d) about 800 to about 1100 g. water;
 - (e) and about 0.005% to about 0.001% (by weight) benzethonium chloride.
9. A method for formulating a sterile, storage stable buffer for calibrating pH electrodes comprising:
- (a) preparing a liquid mixture comprising benzethonium chloride and a buffering agent selected from the group consisting of: sodium phosphate, potassium phosphate, potassium acid phthalate, sodium carbonate, sodium

- bicarbonate, 2-[N-cyclohexylamino]ethanesulfonic acid, and N-[2-hydroxyethyl]piperazine-N'-[2-ethanesulfonic acid]; and
- (b) subjecting the mixture to sterilization by gamma irradiation.
10. The method of claim 9, wherein the sterilization step consists of subjecting the buffer mixture to 15-35 kGy of gamma irradiation.
11. The method of claim 9, wherein the buffering agent is added to the mixture to a concentration of about 50 mM to about 200 mM.
12. The method of claim 9, wherein the buffering agent is added to the mixture to a concentration of about 50 mM to about 100 mM.
13. The method of claim 9, wherein the benzethonium chloride is added to the mixture to a concentration of about 0.001% to about 0.01% (by weight).
14. The method of claim 10, wherein the gamma irradiation effects a change in pH of the buffer mixture of no more than about 0.05 pH units.
15. A method of calibrating pH electrodes comprising
- (a) formulating a buffer solution of known pH consisting essentially of KH_2PO_4 , Na_2HPO_4 , NaCl, water, and benzethonium chloride;
- (b) irradiating the buffer solution with about 15-35 kGy of gamma radiation;

- (c) exposing pH electrodes to be calibrated to the buffer solution;
- (d) detecting the pH as measured by the pH electrodes; and
- (e) comparing the pH detected in step (d) with the known pH of the buffer solution.